

Quadratics

25 Which function is equivalent to $f(x) = 6x^2 - 13x + 5$?

A $f(x) = (3x - 1)(2x + 5)$

B $f(x) = (3x - 5)(2x - 1)$

C $f(x) = (3x - 1)(2x - 5)$

D $f(x) = (3x - 5)(2x + 1)$

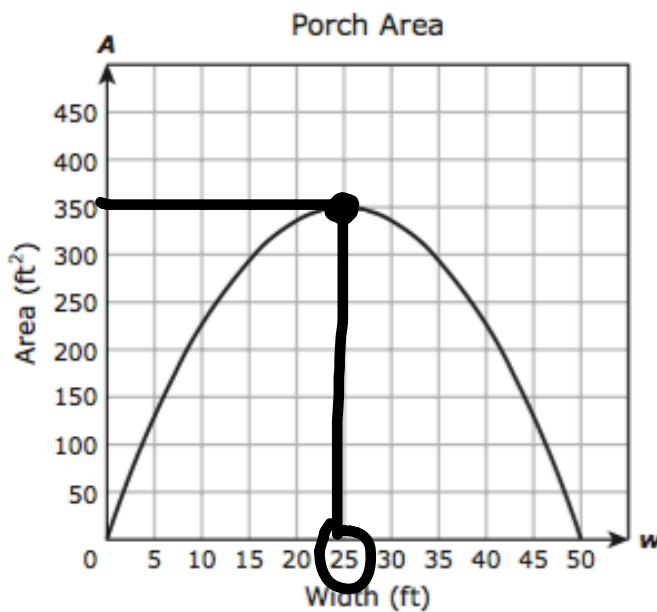
FOIL answer choices

Factor
 $ac = 30$

$2x$	$6x^2$	$-10x$
-1	$-3x$	5

M	S
30	-13

44 The graph models A, the area in square feet of a rectangular porch with a length that is 0.56w less than 28 ft given a width of w feet.



Based on the graph, what is the width in feet of the porch with the greatest area?

F 175 ft

G 50 ft

H 25 ft

J 350 ft

Quadratics

27 Quadratic functions g and k are shown below.

$$g(x) = 5x^2 - 12$$

$$k(x) = 5x^2 + c$$

For what value of c will the graph of k be 9 units above the graph of g ?

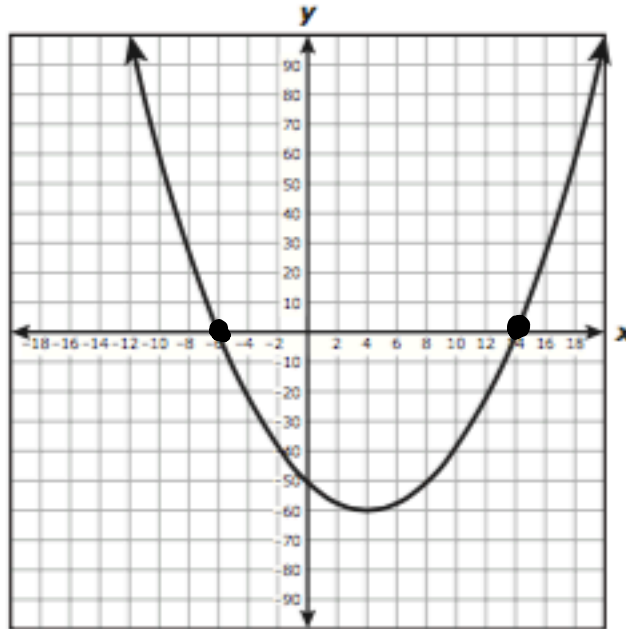
Record your answer and fill in the bubbles on your answer document.

$$-12 + 9 = -3$$

$$c = -3$$

Quadratics

- 3 The graph of quadratic function r is shown on the grid.



What is a solution to $r(x) = 0$?

A -50

B 4

C 14

D -60

$y = 0$
↳ where graph crosses x-axis
-6 and 14

Quadratics

17 Points (3, 2) and (7, 2) are on the graphs of both quadratic functions f and g . The graph of f opens downward, and the graph of g opens upward. Which of these statements are true?

- I. The graphs of f and g have the same axis of symmetry. **T**
- II. The graphs of f and g have the same x -intercepts. **F**
- III. The graph of f has a maximum point, and the graph of g has a minimum point. **T**
- IV. The graph of f is the result of a reflection of the graph of g across the x -axis. **F**

- A I only
- B II only
- C II and IV
- D I and III

32 There are 32 founding members of an organization. The function $y = 3x^2 + 32$ can be used to determine the number of members in the organization after x months. Based on this function, which statement is true?

Calculator → Table

- F The number of members in the organization increases by 9 members each month.
- G At the end of 16 months, there will be 288 members in the organization.
- H The number of members in the organization increases by 3 members each month.
- J At the end of 6 months, there will be 140 members in the organization.

37 What are the solutions to the equation $3x^2 + 15x = 18$?

- A $x = -3$ and $x = -2$
- B $x = -6$ and $x = 1$
- C $x = 6$ and $x = 13$
- D $x = 0$ and $x = 1$

DESMOS

Quadratics

- 30 The function $L = 0.8T^2$ models the relationship between L , the length in feet of a pendulum, and T , the period in seconds of the pendulum. Which value is closest to the period in seconds for a pendulum that is 30 ft long?

F 5.4 s

G 4.9 s

H 6.8 s

J 6.1 s

$$L = 0.8T^2 \quad L = 30$$
$$\frac{30}{0.8} = \frac{0.8T^2}{0.8}$$
$$\sqrt{37.5} = \sqrt{T^2} \quad T = 6.1$$

DESMOS
 $30 = 0.8T^2$

- 21 When a contractor paints a square surface that has a side length of x feet, he needs to know the area of the surface in order to buy the correct amount of paint. Since the contractor always adds 25 square feet to the area, he buys extra paint. Which function can be used to find the total area in square feet, $A(x)$, that the contractor will use to determine how much paint he needs to buy?

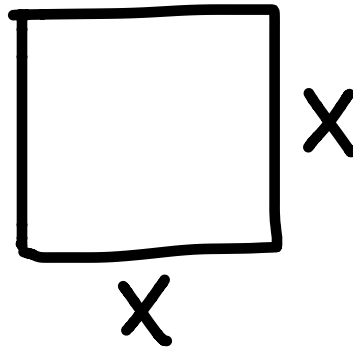
A $A(x) = 25x^2$

B $A(x) = (25 + x)^2$

C $A(x) = (25x)^2$

D $A(x) = x^2 + 25$

$$A = LW$$



$$A = x^2$$

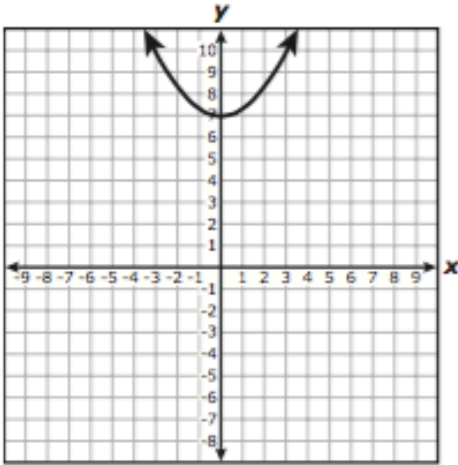
Quadratics

-7

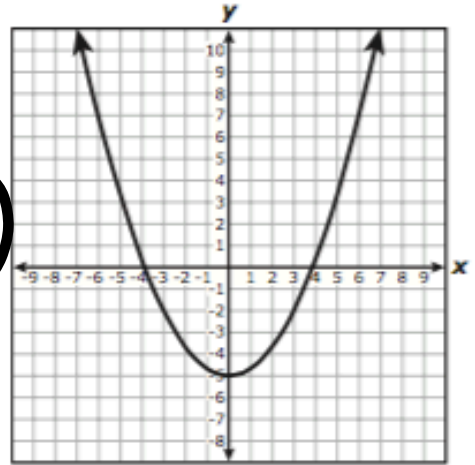
33 Which graph can be obtained by translating the graph of $h(x) = 0.33x^2 + 2$ down 7 units?

$$= 0.33x^2 - 5$$

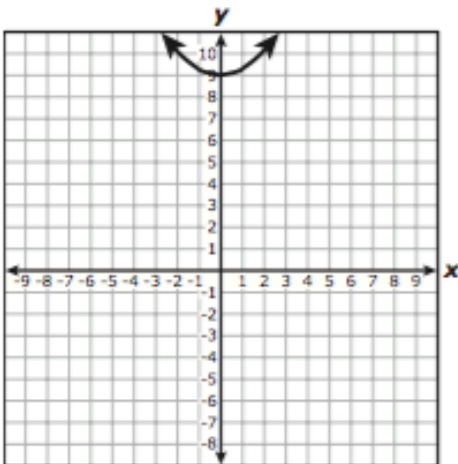
A



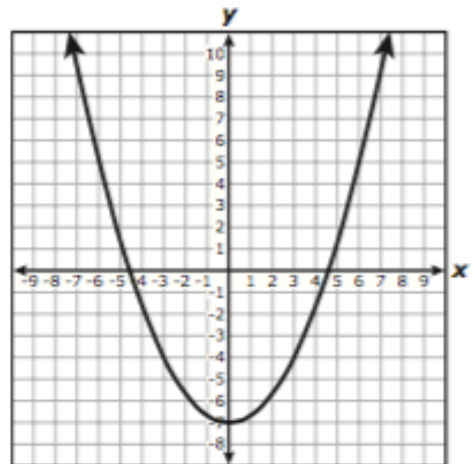
C



B

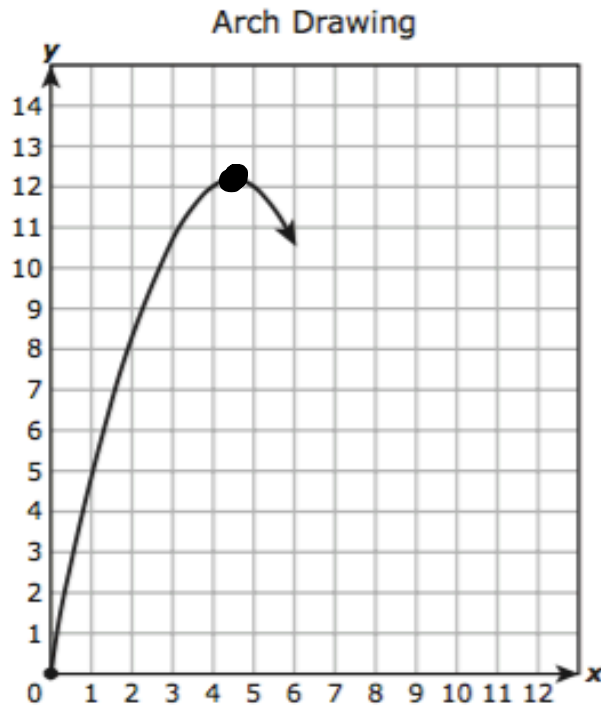


D



Quadratics

- 43 An architecture student is drawing a graph of an arch. As shown below, the arch has the shape of a parabola that begins at the origin and has a vertex at (4.6, 12.2).



Other than the origin, at which point will the graph intersect the x-axis?

- A (12.2, 0)
- B (9.2, 0)
- C (4.6, 0)
- D (10.6, 0)

Double vertex

$$(4.6)(2) = 9.2$$

- 16 Which statement about the quadratic parent function is true?

- F Its graph is symmetrical about the x-axis. **F**
- G** Its graph is symmetrical about the y-axis. **T**
- H Its domain is the set of all non-negative numbers. **F**
- J Its range is the set of all real numbers. **F**

$$y = x^2$$

Quadratics

21 Which statement about the quadratic functions below is false?

DESMOS or
calculator

y =

$$f(x) = -\frac{3}{4}x^2 + 6$$

$$g(x) = -2x^2 - 5$$

$$h(x) = \frac{1}{4}x^2 + 1$$

A The graphs of two of these functions have a minimum point.

F

B The graphs of all these functions have the same axis of symmetry.

T

C The graphs of two of these functions do not cross the x-axis.

T

D The graphs of all these functions have different y-intercepts.

T

40 Which statement about the quadratic equation below is true?

$$-4.5x^2 + 72 = 0$$

DESMOS

F The equation has $x = 4$ as its only solution.

F

G The equation has no real solutions.

F

H The equation has $x = 4$ and $x = -4$ as its only solutions.

T

J The equation has an infinite number of solutions.

F

Quadratics

24 What are the solutions to the equation $x^2 - 4x = -1$?

~~F~~ $x = \frac{-4 \pm \sqrt{20}}{2}$

G $x = \frac{4 \pm \sqrt{12}}{2}$

~~H~~ $x = \frac{-4 \pm \sqrt{12}}{2}$

~~J~~ $x = \frac{4 \pm \sqrt{20}}{2}$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$a = 1 \quad b = -4 \quad c = 1$$

$$= \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(1)}}{2(1)}$$

$$= \frac{4 \pm \sqrt{16 - 4}}{2}$$

$$= \frac{4 \pm \sqrt{12}}{2}$$

DESMOS
Convert
answer choices
to decimals
and compare

Quadratics

- 13 The table of values for quadratic function g is shown below.

y

x	$g(x)$
-3	48
-2	30
-1	16
0	6
2	-2
3	0
4	6
6	30

$y = 0$

If 1 is a solution to $g(x) = 0$, what is the other solution?

A -1

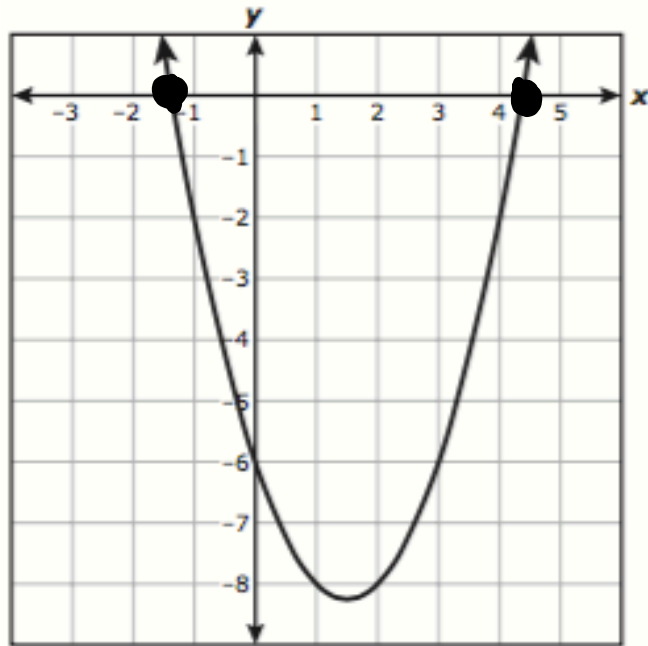
B 3

C 6

D -2

Quadratics

- 5 The graph of quadratic function g is shown below.



Based on the graph, between which two values of x is a zero of g located?

A -9 and -8

B 1 and 2

C -7 and -5

D 4 and 5

↓
where graph
crosses x-axis

-zero between -2 and -1
and between 4 and 5

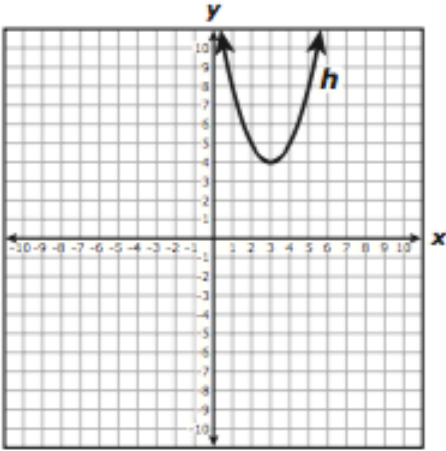
Quadratics

$x\ y\ x\ y\ x\ y$

compare ordered pairs (x, y)

25 The graph of the quadratic function h passes through the points $(-4, 32)$, $(3, 4)$, $(5, 14)$, and $(7, 32)$. Which of the following shows the same relationship as h ?

$x\ y$

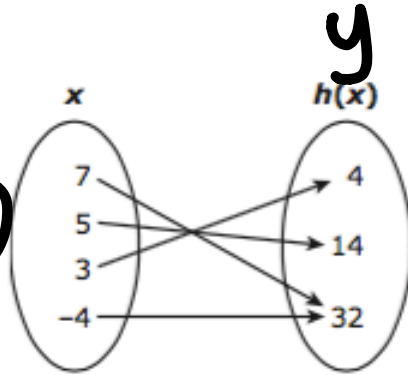


y

x	$h(x)$
32	-4
4	3
14	5
32	7

x

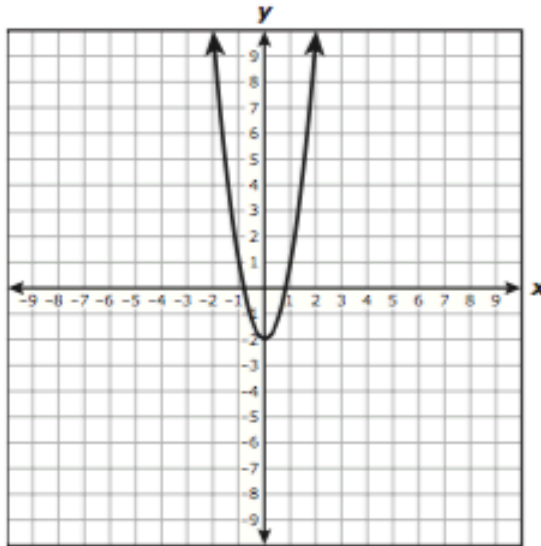
D



$h(x) = x^2 + 3x + 4$
calculator
→ Table

Quadratics

19 The graph of $y = 3x^2 - 2$ is shown below.



$y = ax^2 + c$
• changing the 'a' value will make the graph wider or narrower

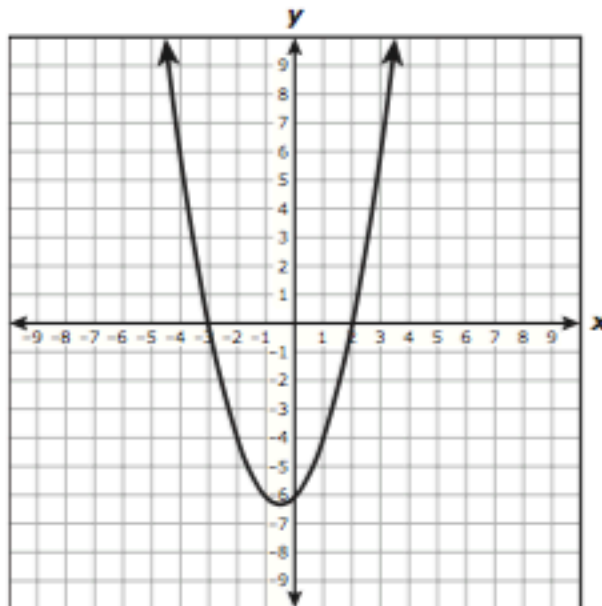
If the coefficient of x^2 is changed from 3 to another positive number to create a new function, how will the graph of the new function compare with the graph of the original function?

- A The x-intercepts of the new graph will be the same as the x-intercepts of the original graph.
- B The vertex of the new graph will be different from the vertex of the original graph.
- C The new graph will be wider or narrower than the original graph.
- D The new graph will open in the opposite direction as the original graph.

- negative 'a' value flips the graph opening to opposite direction
- 'c' value shifts the graph up or down which would affect the vertex

Quadratics

28 The function $y = x^2 + x - 6$ is graphed below.



What are the values of x when $x^2 + x - 6 = -4$?

F $x = -4$ and $x = 6$

G $x = -2$ and $x = 1$

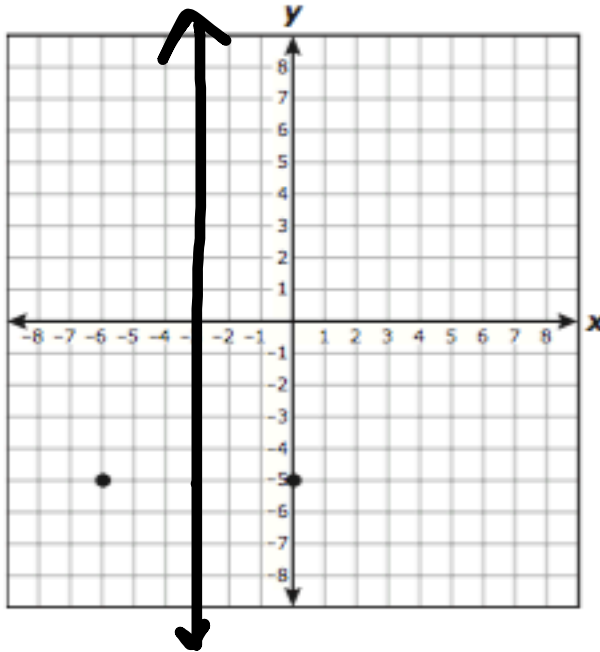
H $x = -3$ and $x = 2$

J $x = -5$ and $x = -6$

DESMOS

Quadratics

- 41 Two points on the graph of a quadratic function are shown on the grid below.



What is the equation for the axis of symmetry of the graph of this function?

- A $x = -3$
- B $y = -3$
- C $x = -5$
- D $y = -5$

$x = -3$

Quadratics

- 34 A table of values for the quadratic function f is shown below.

y

x	$f(x)$
-8	-2.75
-7	0
-6	2.25
-5	4
-4	5.25
-3	6
-2	6.25
-1	6
0	5.25
1	4

$y = 0$

If 3 is one solution to $f(x) = 0$, what is the value of the other solution?

Record your answer and fill in the bubbles on your answer document.

-7

- 15 What is the solution set for the quadratic equation $x^2 - 16 = 0$?

- A {4}
B {-4, 4}
C {256}
D {-256, 256}

DESMOS

Quadratics

2 What is the vertex of the graph of the quadratic function $f(x) = x^2 + 6x + 10$?

F $(3, -1)$

G $(-3, -1)$

H $(-3, 1)$

J $(3, 1)$

DESMOS

46 What are the x-intercepts of the graph of the quadratic function $f(x) = 5x^2 + 4x - 1$?

F $\frac{1}{5}$ and -1

G $-\frac{1}{5}$ and 1

H 0 and -1

J $-\frac{2}{5}$ and $1\frac{2}{5}$

DESMOS

calculator:
Decimal \rightarrow Fraction
Math \rightarrow Enter \rightarrow Enter

Quadratics

- 34 A table of values for the quadratic function f is shown below.

y

x	$f(x)$
-8	-2.75
-7	0
-6	2.25
-5	4
-4	5.25
-3	6
-2	6.25
-1	6
0	5.25
1	4

$$y = 0$$

If 3 is one solution to $f(x) = 0$, what is the value of the other solution?

Record your answer and fill in the bubbles on your answer document.

-7

- 53 Which expression is equivalent to $-6x^2 - 11x - 4$?

- A $(3x + 7)(3x - 3)$
- B $(-3x + 4)(2x - 1)$
- C $(3x - 7)(3x + 3)$
- D** $(-3x - 4)(2x + 1)$

Factor